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MINIMUM WAGES AND POVERTY IN DEVELOPING COUNTRIES: SOME EMPIRICAL EVIDENCE

Nora Lustig and Darryl McLeod

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Nora Lustig is a Senior Fellow in the Foreign Policy Studies Program of the Brookings Institution. Darryl McLeod is a professor in the Department of Economics at Fordham University in New York. This paper was prepared for the project on labor market reform in Latin America co-organized by the Brookings Institution and the World Bank; it was presented at the "Conference on Labor Markets in Latin America," organized by the Brookings Institution, the Instituto and the Universidad Torcuato di Tella, and the World Bank, held in Buenos Aires, July 6 and 7, 1995. The project has received financial support from the MacArthur Foundation and the World Bank. The authors greatly benefited from comments and suggestions by George Akerlof, Gary Burtless, Susan Collins, Alejandra Cox-Edwards, Sebastian Edwards, Albert Fishlow, Richard Freeman, Edward Leamer, Martin Rama, Martin Ravallion, Jaime Ros, and Jacques van der Gaag as well as by the participants at the conference in Argentina and the Economic Studies Program-Work in Progress series at the Brookings Institution. The authors are especially grateful to Shihua Lu for excellent research assistance and to Marcelo Cabrol, Moo-Ho Han, and Esen Raifoglu for their invaluable assistance in gathering and compiling the data. They also want to thank Dan Dougan and Michael McLaen for their help in this task. The views expressed are those of the authors and should not be interpreted as reflecting the views of any of the above, or of the trustees, officers or other staff of the Brookings Institution or the World Bank. All errors and omissions remain the responsibility of the authors.

Minimum Wages and Poverty in Developing Countries: Some Empirical Evidence

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ABSTRACT

This paper examines the relationship between minimum wages and poverty in developing countries. We regress changes in poverty indicators for a group of developing countries on minimum wage changes, changes in public spending, human capital investment and other variables associated with changes in poverty. We find that higher minimum wages are associated with lower levels of poverty. This result is replicated across a range of poverty measures and country groupings. Higher minimum wages are also associated with higher unemployment, so the potential reduction in poverty is not costless from an efficiency point of view.

Nora Lustig
The Brookings Institution
1775 Massachusetts Ave., NW
Washington D.D. 20036
Tel. (202) 797-6027
Fax (202) 797-6003

Darryl McLeod
Dept. Of Economics
Fordham University
441 East Fordham Rd.
The Bronx, NY 10458
Tel. (718) 817-4064
Fax (914) 332-9698

Introduction

Increased emphasis on job creation in developing countries has focused attention on institutional rigidities such as minimum wage laws. In particular, partly induced by the structural reform agenda fostered by international financial institutions, Latin American governments seeking to become more competitive in the international arena are targeting labor market rigidities as impediments to reform and job creation. Interestingly, some East Asian governments are moving in the opposite direction as their major OECD trading partners seek to impose "fair labor standards" as a condition of further trade liberalization and market access.[1] Korea, for example, has passed a minimum wage law as recently as 1988. As these opposing forces gain momentum, the question of whether changes in labor market regulations hurt or benefit the poor in developing countries becomes particularly relevant. In this paper we shall analyze one aspect of this question: specifically, the impact of changes in statutory minimum wages on poverty.

The regression results presented in this paper show that minimum wages and poverty are inversely related: i.e., an increase (decline) in real minimum wages is accompanied by a fall (rise) in poverty. These results are replicated across different poverty measures (the headcount ratio and the poverty gap), poverty lines (extreme and moderate poverty lines), or population groups (urban and rural). The inverse relationship is also found when observations are classified into positive growth cases and negative growth cases, or the sample distinguished the observations for Latin America and Asia.

Although the result that minimum wages and poverty are inversely related seems to be robust, one cannot conclude that a rise in the minimum wage will reduce poverty in specific contexts. The empirical exercise presented in this paper suffers from all the usual shortcomings of cross-section analysis. Moreover, it is important to note that we <u>do not</u> try to estimate the efficiency losses (gains) that may result from higher (lower) minimum wages. Even if minimum wages can be shown to

[1] An example of this sort of pressure was the request for Mexico to raise its minimum wage at the rate of productivity growth as one of the conditions put forward by some pro-labor U.S. Congressmen for NAFTA's passage.

reduce poverty, they are not the most efficient way to achieve this objective.[2]

The paper is organized as follows. The next section briefly reviews the relationship between minimum wages and informal sector wages in labor market models with covered and uncovered sectors. Section II presents the analysis of the regression results on the relationship between minimum wages and poverty. The paper ends with a section of concluding remarks.

I. Minimum Wages and Poverty: the Theory

In principle, there are a number of reasons why changes in statutory minimum wages should have little or no impact on poverty rates in developing countries. First, coverage of minimum wage laws is limited and the laws are notoriously difficult to enforce. Second, workers who benefit directly from minimum wage increases are usually not the countries' poorest. In the developing world a significant proportion of the poor may work in the uncovered or are elf-employed, and the chances of being poor are higher in the latter. Finally, the government may not be able to influence real minimum wages through changes in statutory minimum wages because increases in the latter are quickly eroded by the price inflation induced by such increases.

Recently, the debate over the impact of minimum wages has been rekindled by the "new economics" of the minimum wage that provides some evidence suggesting minimum wages may have minimal negative impacts on employment and, in some instances, contribute to the reduction of poverty in developed countries.[3] The conventional wisdom for developing countries holds that minimum wage increases should have no or negative impacts on the poor in LDC labor markets. For instance, the 1995 World Bank's World Development Report, devoted to labor market issues, states

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[2] See, for example, the discussion in Saint-Paul (1994). In the case of Latin America and the Caribbean, Rama finds that the costs in terms of economic performance of minimum wages is not significant. (Rama, 1995)

[3] Card and Krueger (1995).

that "[m]inimum wages may help protect the most poverty-stricken workers in industrial countries, but they clearly do not in developing nations."[4]

Most of the arguments focus on variations of the Harris-Todaro model.[5] Under certain assumptions, the presence of a large uncovered sector means that a rise in formal sector wages push more unemployed into the informal sector driving down its wages. However, as Gramlich (1976)--and, more recently, Hamermesh (1993) and Card and Krueger(1995)--emphasize, this argument depends on a particular constellation of elasticities. If formal sector labor demand is inelastic, wages in both sectors may rise together with a boost in formal sector wages.[6] However, as Jeffery Williamson (1989) and others have emphasized, many of the empirical predictions of the Harris-Todaro model do not seem to be borne out by empirical studies of developing country labor markets. Hence it does not provide a solid basis to analyze the impact of minimum wages in developing countries.

Nevertheless, there are reasons why *a priori* minimum wage legislation should have a greater impact on the poor in developing countries. Unskilled labor income is a more important determinant of poor workers' income in less developed countries than in developed countries, where a large portion of the poor are unemployed, welfare recipients or retired. Because the minimum wage and poverty lines are closer to each other, a minimum wage increase may lift workers out of poverty in contrast, for example, with the United States where earning a minimum wage is often not enough

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[4] World Bank (1995), p. 75. The International Labor Organization has a different view. For the ILO "...minimum wages are a potentially important labour market policy instrument for reducing poverty... ." (Rodgers ,1995, p. 48). For more on this issue see Lipton (1995), p. 130.

[5] Among the first formal modeling of the impact of minimum wages see, for example, Mincer (1976) and Welch (1974).

[6] Another formulation are the "demand-link" models. Here the changes in the distribution of income generated by raising the minimum wage may cause uncovered sector incomes to rise. This result largely depends on the changes in demand patterns of covered sector workers induced by the minimum wage increase. (Fiszbein, 1992) The idea that covered and uncovered sectors are linked not only through the labor market but also through the goods market was initially developed, for example, by Tokman (1978). Also, see Cole and Sanders (1985).

to lift the poor out of poverty.[7]

Moreover, theoretical analysis has gone beyond the partial-equilibrium framework which underlies the Harris-Todaro model. General equilibrium analysis by Carruth and Oswald (1981) and Leamer (1995) has shown that in small open economies a rise in formal sector wages always raises both covered and uncovered wages while reducing the capital rental rate.[8] The intuition behind this result is straightforward: a rise in union or minimum wages in the formal sector cannot be passed along in higher prices, profits fall leading to a migration of capital rather than labor out of the formal sector. Capital moves to the informal sector driving up wages and employment there as well.[9] In closed economies, the reverse is likely to be true: covered sector wages may move inversely with uncovered wages although the outcome depends on key parameters in the model. In addition, scattered evidence suggests that in some cases--Brazil and Mexico, for example[10]-- formal and informal wages move together contrary to predictions from conventional analysis which would lead us to expect them to be inversely related.

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[7] See the ratio of minimum wages as a percent of poverty lines for some of the developing countries used in this study in Table 4 below.

[8] Although Carruth and Oswald's model was meant to analyze the impact of unions, their analysis applies to minimum wage legislation as well.

[9] It should be emphasized that in the Harris-Todaro model, the "demand-link" models and the general equilibrium analysis the results concerning the effects of minimum wage changes do not depend on the existence of a non-standard relationship between minimum wages and employment in the covered sector. In contrast to some of the models posited by the "new economics" of the minimum wage (e.g., Card and Krueger, 1995, p. 236), in these models higher real wages in the formal sector lead unequivocally to lower levels of formal employment. Equally a non-standard result does not require that the poor work in minimum wage jobs. One needs to assume, however, that the government can affect the real value of the minimum wage through statutory changes on the nominal minimum wage and that the minimum wage is enforced at least in part of the economy.

[10]See Maloney (1996) on Mexico and World Bank (1990), p. 110 on Brazil and Costa Rica. Also, see studies mentioned in footnote eleven.

In sum, the conventional wisdom holds that minimum wage laws are likely to harm uncovered and rural workers in developing countries. Most of these arguments appeal to a particular case of the Harris-Todaro model in which higher formal sector wages force workers back into the informal sector pushing down incomes there. But theoretical results from small open economy models suggest otherwise. Also, to the extent that minimum wage laws affect unskilled wages, they are more likely to reduce poverty in developing countries than in industrialized countries.

The preceding discussion reveals that the impact of changes in statutory minimum wages on poverty in developing countries is really an empirical issue. Available econometric work has usually focused on the relationship between minimum wages and wages of the unskilled workers. The existing studies often find the relationship to be positive.[11] However, these studies usually focus on urban workers while the stronghold of poverty in developing countries is in rural areas. In addition, estimating labor market parameters is very data-intensive and, therefore, difficult to carry out for a large number of countries simultaneously. An alternative approach is to estimate the determinants of poverty and include the minimum wage as one of the explanatory variables. In this paper we chose such a course. Specifically, we analyze the relationship between minimum wages and poverty by regressing changes in poverty rates on changes in the minimum wage and other variables which could affect poverty levels for a cross-section of developing countries.

II. Minimum Wages and Poverty: Cross-national Evidence from Developing Countries

The preceding discussion shows that, in the short-run, poverty measured by the headcount

[11] See, for example, Marquez (1981), Reyes-Heroles (1983),Wells and Drobny (1982), and Cicchelli-Velloso (1990). See also the studies mentioned in Freeman (1993), p. 128; in Shaheed in Figueiredo and Shaheed, eds., (1995); and International Labor Organization (1988); and, Bell (1995).

ratio will tend to fall with higher minimum wages as long as[12]: 1) higher minimum wages result in higher uncovered sector wages; 2) the rise in uncovered sector wages is large enough to push some of the population out of poverty; and, 3) the number of the beneficiaries (i.e., those who are no longer poor) exceeds the number of those who become poor because the increase in minimum wages left them unemployed or earning less in the uncovered or "subsistence" sector.

Available studies for Latin America show that a rise in the minimum wage may reduce poverty (and viceversa), at least in the short-run. Morley (1992), for example, looks at the relationship between minimum wages and poverty in a cross-section of Latin American countries and finds that there is a negative correlation between minimum wages and poverty. The coefficient, however, loses significance when the relationship is analyzed for periods of recession only. Also using a sample for Latin America, de Janvry and Sadoulet (1996) find that the coefficient is negative (i.e., higher minimum wages imply lower poverty levels) in most cases. In contrast to Morley, in the case of urban poverty the coefficient is significant but only during recession. These studies, however, have observations for Latin America only. In this paper, the empirical analysis includes a number of developing countries outside this region.

Poverty and Minimum Wages: a Cross-National Analysis

Research in this area has been limited by a lack of consistent and frequent poverty statistics for developing countries. Though a lack of poverty data remains a serious problem, the availability of consistent poverty statistics has greatly improved recently as several research groups at the World Bank and the ILO have compiled comparable poverty rates for a number of developing countries. We use the poverty data compiled by these studies to assemble a sample including 22 countries and over 40 time intervals.[13]

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[12] The underlying assumption is that the conventional poverty line is below the statutory minimum wage and is higher or equal to Hamermesh's "subsistence wage".

[13] See Tables A.1, A.2, A.3 and A.5 in the Appendix.

Using this sample, we regress *changes* in the standard headcount and other poverty measure on key determinants of poverty including real wages and per capita income growth. This approach avoids the inherent problems in comparing the level of poverty across countries (e.g., the lack of comparability across poverty lines and the need to include a number of state variables). Among the independent variables we tested there are several structural variables such as stock of human capital or the share of the labor force in agriculture which can be measured in a common way across countries. Unlike previous studies, our sample includes sixteen non-overlapping sample intervals from nine countries outside Latin America, five Asian and four African countries (see Table A.1). These observations are combined with sample intervals from thirteen Latin American countries.[14]

Restricting each sample to non-overlapping intervals excludes a number of observations. However, by using alternative criteria to select non overlapping groups some of these observations can still be utilized. In every case our choice of countries and time intervals are dictated by the availability of consecutive survey-based poverty measures using identical poverty lines.[15] Missing real minimum wage series also impose limitations on the sample size: about ten observations of changes in poverty had to be dropped because there was no data on minimum wages.

We begin by examining the impact of real wage and real per capita income growth on poverty separately. The regressions reported in the first three columns of Table 1--and Figures 1, 2 and 3-- reveal the expected positive correlation between per capita income growth, real (minimum and average) wages and poverty. Comparing regressions 1.2 and 1.3, the explained variance and the statistical significance are clearly higher for changes in real minimum wages than either of the other two real wage variables tested: the average real wages reported collected by the ILO Year Book of

[14] The main source of the poverty data presented in Table A.5 are two compilations recently assembled by the World Bank and ILO. The main source of minimum wage data is the ILO (1988). Average wages come primarily from the ILO's Year Book of Labour Statistics and CEPAL (1994). These two sets differ slightly in some high inflation countries, so both series were tested yielding very similar results. All the series used in the regressions are available from the authors upon request.

[15] See Tables A.2 and A.3 in Appendix.

Table 1

Poverty and Real Wages: Headcount Poverty Measures

Dependent Variable: Log annual change in Poverty 1/

All variables are annual log changes, except where noted

(t statistics in parentheses, and all coefficients significant at 5% level are in bold typeface)

	(1.1)	(1.2)	(1.3)	(1.4)	(1.5)	(1.6)*	(1.7)	(1.8)*	(1.9)*	(1.10)*
Poverty Line: 6/	High	High	High	High	High	Low	High	Low	High	High
Per Capita Income	**-1.90** (-5.77)			**-1.08** (-2.53)	-0.63 (-1.85)	**-1.93** (-3.50)				**-0.72** (-2.13)
Real Minimum Wage			**-0.97** (-6.03)	**-0.78** (-4.08)	**-0.64** (-4.24)	**-1.09** (-4.00)	**-0.71** (-4.68)	**-1.29** (-4.00)	**-0.81** (-3.68)	**-0.61** (-3.64)
Average Real Wage		**-0.69** (-2.07)		0.15 (.66)						
Real Public Spending							-0.20 (-1.06)	-0.54 (-1.54)	-0.24 (-1.06)	
Terms of Trade					**-0.36** (-2.56)		**-0.44** (-3.00)		**-0.42** (-3.11)	**-0.40** (-2.44)
Human Capital Stock 4/					-0.36 (-1.23)		-0.46 (-1.49)		-0.55 (-1.72)	-0.42 (-1.65)
Unemployment									**1.36** (2.41)	
Inflation										0.01 (.40)
Education Exp. as a % of GDP 5/					**-0.77** (-2.21)	**-1.28** (-2.56)	**-0.77** (-2.09)	**-1.25** (-2.17)		
Intercept	0.01 (.58)	-0.02 (-1.5)	**-0.02** (-3.07)	-0.01 (-1.05)	0.02 (1.25)	**0.06** (3.10)	0.02 (1.08)	0.04 (1.71)	0.01 (.55)	0.00 (.15)
White F Test statistic	0.68	0.53	2.25	0.92	0.48	0.85	1.25	0.29	0.91	0.48
Prob Value 2/	0.62	0.60	0.13	0.50	0.88	0.55	0.32	0.93	0.56	0.89
Adjusted R-Squared	0.47	0.12	0.55	0.67	0.74	0.71	0.72	0.61	0.71	0.69
Number of Observations	39	26	30	24	30	23	30	23	20	30

1/ This log change in the headcount is the growth rate of the poor less that of the total population.

2/ This is the F test for White's Heteroscedasticity test without cross terms. A high F or low prob values suggests the null hypothesis of homoscedastic errors should be rejected.

3/ The unemployment variable is the change in the unemployment rate divided by the number of years in the interval.

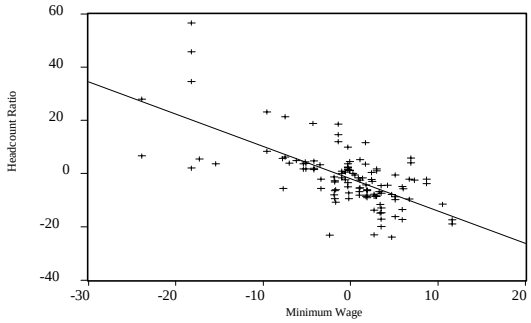
4/ Human capital growth is proxied by the log change in average years of secondary education per adult.

5/ Average education expenditures as a percent of GDP is often an important state variable.

6/ The high and low poverty line are typically $50-60 per month and $30 per moneht respectively, both in 1985 PPP dollars.

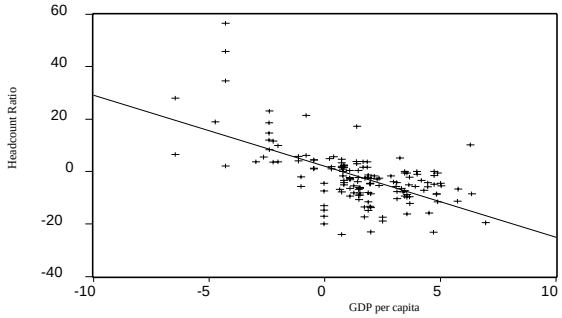
* The t-statistics are calculated using White consistent errors.

Figure 1. Headcount Ratio vs. Minimum Wage (in log changes)



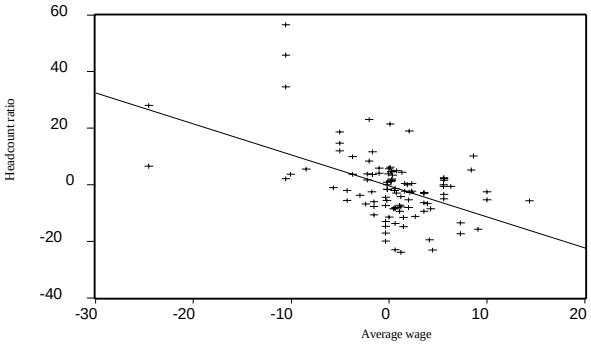
Note: All observations for high and low poverty line, including overlapping periods.

Figure 2. Headcount Ratio vs. GDP Per Capita (in log changes)



Note: All observations for high and low poverty lines, including overlapping periods.

Figure 3. Headcount Ratio vs. Average Wage (in log changes)



Note: All observations for high and low poverty lines, including overlapping periods.

Labour Statistics or the real manufacturing earnings series reported in the World Bank's World Tables. Note, however, that the three wage series were often not available for each country so the regressions reported in Table 1 are based on slightly different samples.[16]

Equation 1.4 adds minimum wages and average wages to the per capita income growth equation 1.1. Both the real minimum wage and growth coefficients remain highly significant but the average wage coefficient drops dramatically in significance. As soon as we control for per capita income changes or changes in minimum wages the average and manufacturing wage coefficients become insignificant.[17] Though heteroscedasticity is potentially a problem in regression 1.3 as the White Test indicates, we find it generally true that the impact of average wages on poverty cannot be separated from that of per capita income and minimum wages. In over one third (89) of our observations in the full sample (including overlapping periods) poverty rose over the interval in questions and in 134 cases it fell. Similarly, real minimum wages rose in about two thirds of our observations and fell in 70 cases. This implies that our estimates do not simply represent trends in these two key variables.

These results suggest minimum wages affect poverty more than average wages and that they are less correlated with changes in national income.[18] This is consistent with the fact that minimum wage laws affect mainly unskilled wages and therefore may be a more important determinant of poor worker income. The lack of correlation with national income can also be explained by the fact real

[16] Ideally, one should have used wages for unskilled workers. However, there are not enough observations available to be used in regressions.

[17] Regressing poverty changes on real manufacturing earnings and education expenditurues yeilds a real wage coefficient of -.85 with t statistic of -1.65 but the adjusted R squared is only about .1 even with the education variable.

[18] Table A.4 in the Appendix shows a three-way classification of countries and periods according to the direction of change in poverty, minimum wages and income per capita.

minimum wages are a government policy target.[19] Real minimum wages remain highly significant but the magnitude of the effect on poverty drops substantially when we control for per capita income growth. Also the variance explained by equation 1.4 is substantially higher than in the previous regressions.

Though real minimum wages seem to affect poverty independently of average wage and per capita income growth, this correlation may result from other government policies or employment opportunities moving in tandem with minimum wages. Minimum wage changes may thus signal a broader commitment by government to reduce poverty using a variety of policy measures. We found little evidence to support this hypothesis. As discussed below the impact of low wages on poverty persists even when available government spending variables are controlled for. Also where time series on social spending are available, they are not positively correlated with real minimum wages. In fact the correlation is often negative.[20] Changes in agricultural output and prices also affect poverty especially in low income countries.

To allow for these potential interactions we tested a number of public spending and agricultural income measures.[21] Unfortunately, there are few consistently reported series on social spending targeted at the poor. Where time series are not available, we use time invariant averages as "state variables" capturing each country's ongoing commitment to particular programs. Regressions 1.5 to 1.8 are typical of those including a broader range of policy and state variables. The social spending state variables we tested included total current spending, spending on social programs, and spending on social security. The most relevant state variable seems to be the share of

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[19]Variations on equation 1.4 not reported here confirm these suppositions. Both average wage measures become insignificant when per capita income growth or minimum wage changes are added to the regression.

[20] These results can be obtained directly from the authors upon request.

[21] Domestic agricultural terms of trade are not available for most countries, so we used external terms of trade along with changes in real agricultural value added.

education expenditures as a percent of GDP. A related but time varying measure is annual changes in secondary education years per adult. This measure of human capital did better than either total or primary years per adult, though the *level* of primary education per adult--not the change--sometimes affected the rate of decline in severe poverty. Changes in total real government consumption is the only broadly available indicator of government spending on social programs. The other public spending measures tested were not statistically significant.[22]

Changes in agricultural value added or its GDP share had no consistent impact on how fast poverty rose or fell so regressions including this variable are not reported. External terms of trade changes, however, do affect households near the high poverty line[23]. When the terms of trade variable was included in regressions 1.6 and 1.8 (where the sample is based on low poverty lines) it turned out not to be significant (and, hence, it is left out from the reported regressions). Since most severe poverty is in rural areas this suggests terms of trade changes affect the urban poor in commodity exporting nations and the upper strata of the poor population in rural areas. This is consistent with the findings of Ravallion and Huppi (1989) suggesting that higher rice prices help the upper strata of the poor most.

Controlling for other factors such as human capital investment or per capita income growth reduces the poverty-minimum wage elasticity from almost 1.0 to the .6 to .8 range, but real minimum wages remain an important (and, statistically significant) determinant of poverty. Observe that the poverty-minimum wage elasticity is always higher for the low poverty line sample. This seems counter-intuitive but in fact is an artifact of how we measure the change in poverty.[24] (See

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[22] Again, recall that comparable annual measures of social spending are very difficult to obtain for developing countries.

[23] Data on domestic terms of trade was not available for the countries and periods required.

[24] If we use the annual difference in the headcount rather than the log change, much of the difference between the high and low poverty line disappears. Note also that all the coefficients are consistently higher in the low poverty line regressions, suggesting the metric of the dependent variable is a factor. The per capita income coefficient, for instance, increases from .63 for the

Appendix)

Since minimum wages affect unemployment, controlling for changes in unemployment is a strictly counter factual exercise. But for the smaller sample of countries for which unemployment is available it is associated with higher poverty. Controlling for unemployment increases the minimum wage coefficient to -.81 in equation 1.9 (from lower levels in regressions 1.5 and 1.7), implying that they are inversely related (i.e., when the unemployment variables is not "artificially" kept constant, raising the minimum wage has a smaller impact on poverty). This inverse relationship between unemployment and minimum wages is also confirmed when we regress unemployment on minimum wages in Table 3.

Cardoso (1992) argues inflation is an important determinant of poverty. However, the coefficient for inflation is not statistically significant in regression 1.10. When the minimum wage variable is dropped from this equation, inflation does have a significant (negative) impact on poverty. Together these results suggest that inflation affects poverty by reducing minimum or unskilled wages.[25] If nominal minimum wages change infrequently or by small amounts compared to inflation, real minimum wage movements may be dominated by changes in the price level. If this were the case, the two variables would be inversely correlated creating a potential problem of multicolinearity, and making it hard to separate the effect of the two variables. Neither of these problems were apparent in our samples. Adding inflation in equation 1.10 has little effect on the minimum wages and other variables' coefficients. Also, replacing minimum wages by inflation in regression 1.5 (not shown here) reduces the R^2 from .71 to .47. This suggests that real minimum wages are capturing more than the effect of inflation on poverty.

Minimum Wage Impacts by Growth Phase, Region and Sector

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high poverty line sample in equation 1.5 to 1.93 for the low poverty line regression 1.6.

[25] Note, however, that for some samples (not shown here) inflation had a small independent effect and the coefficient was statistically significant even after controlling for minimum wage changes.

Previous studies found asymmetric poverty dynamics in recessions and recoveries. Morley (1992), for example, finds evidence that raising minimum wages helps only when the economy is growing. We find evidence of more symmetric impacts. Because our sample includes eight intervals in which per capita income declined, we are also able to test the regional aspects of poverty and real wage changes. There is not enough data for separate regressions, but if we assume all other coefficients are identical across groups, we can split the minimum wage variable into cases where the growth rate is positive or negative. According to equation 2.1, raising minimum wages is more effective in reducing poverty during periods of economic growth-- as one might expect--but the difference is not statistically significant. The results of the Wald test reported at the bottom of Table 2 show we cannot reject the null hypothesis that the two coefficients are equal. Again, these tests constrains other coefficients to be equal across the two sub groups.

Dummy variables can also be added to identify differences in the rate of poverty growth among regions and sectors. In Table 2 we split the real minimum wage change variable between Latin America and Asia/Africa. Both the extent of poverty and wage policy differ between Latin America, Asia and Africa. Regression 2.2 compares the effect of the minimum wages in the seventeen Latin American observations with those for non-Latin American, primarily Asian countries. Again the coefficients are statistically indistinguishable.

Though minimum wages can help uncovered workers in small open economies, it is a labor market policy clearly associated with urban workers.[26] By constructing a predominately low poverty line sample including seventeen rural poverty estimates, we can compare the impact of minimum wages in rural and urban areas (note that in every case we used a national estimate of the minimum wage--only a few countries enforce minimum wages by sector or occupation such as agricultural laborer). The results of this regression are reported in regression 2.3. As might be expected the

[26] The only sectoral dummy that was statistically significant was that for urban poverty rates. Living in an urban area consistently dampened the rate of change in poverty in either direction. This urban dummy was not consistently signficant and had little effect on other coefficients so to preserve degrees of freedom it is not included in the regressions reported here.

Table 2

Poverty and Minimum Wages by Region and Growth Phase

Dependent Variable: Log annual change in Poverty 1/

All variables are annual log changes, except where noted (t statistics in parentheses)

	*2.1: Growth			*2.2: Regions			*2.3: Rural vs. Urban		
Log Change in:	Common	Negative	Positive	Common	Asia	LATAM	Common	Urb/Nat	Rural
Poverty Line 6/	High			High			Low		
Per Capita Income	-0.69			-0.63			**-1.86**		
	(-1.96)			(-1.84)			(-2.20)		
Real Minimum Wage		**-0.57**	**-0.70**		**-0.67**	**-0.63**		**-1.91**	-0.63
		(-3.47)	(-4.40)		(-2.15)	(-4.52)		(-3.13)	(-1.54)
Real Public Spending									
Terms of Trade	**-0.36**			**-0.36**					
	(-2.64)			(-2.71)					
Human Capital Stock 4/				-0.37			-0.07 7/		
				(-1.34)			(-1.47)		
Education Exp. % of GDP 5	**-0.86**			**-0.77**					
	(-2.31)			(-2.11)					
Intercept	0.01			0.01			0.04		
	(.65)			(.65)			(.95)		
White F Test statistic 2/	0.34			0.48			1.62		
Prob Value 2/	0.96			0.90			0.19		
Wald Test statistic 3/		0.73				0.01		2.81	
Prob Value		0.96				0.91		0.11	
Adjusted R-Squared	0.73			0.73			0.55		
Number of Observations	30			30			28		

1/ This log change in the headcount is the growth rate of the poor less that of the total population.
2/ This is the F test for White's Heteroscedasticity test without cross terms. A high F or low prob values suggests the null hypothesis of homoscedastic errors should be rejected.
3/ The null for these Wald Tests is that the two minimum wage coefficients are equal.
4/ Human capital growth is proxied by the log change in average years of secondary education per adult.
5/ Average education expenditures as a percent of GDP is often an important state variable.
6/ The high and low poverty line are typically $50-60 per month and $30 per moneht respectively, both in 1985 PPP dollars.
7/ Human capital for this low poverty line is proxied by the log of the average years of secondary education per adult.

* T-statistics are calculated using White Heteroscedasticity consistent covariance matrix.

minimum wage coefficient is considerably higher for urban and national poverty. Even though the rural minimum wage coefficient is not significant at the 10% level, the Wald test rejects the null of equivalent coefficient with about this same 10% level of confidence.

Lack of data on nominal wages and coverage ratios prevents us from taking these factors into account. Our results, however, indicate a strong correlation between minimum wages and poverty even without conditioning the relationship on coverage ratios or relative wages. For the cases where minimum wages were not binding and coverage is limited, one would expect to find a much weaker correlation between minimum wages and poverty. On the other hand, available information shows that minimum wages are usually set at levels higher than the countries' poverty lines (Table 4), which suggests that to the extent minimum wages reflect unskilled wages (or, they move in tandem), a rise in the former can reduce poverty.[27]

Minimum Wage Impacts and Alternative Measures of Poverty

The headcount measure of poverty is by far the most common, but its limitations are well known. Our final set of regressions corroborates the above results using several other measures of poverty. Regressions 3.1 and 3.2 use the poverty gap instead of the headcount ratio. Although these samples are small, the results are consistent with the headcount estimates reported in equation 1.5. Again we find terms of trade are insignificant for low poverty line groups and the observed coefficients are larger for the low poverty line sample. The only surprising result here is the absence of a per capita growth effect. However, regressing the poverty gap on per capita income alone does yield a significant negative relationship: poverty gaps go down when per capita income goes up.

Regression 3.3 using the same time periods and country sample but replaces the poverty

[27] Although the information on Table 4 is for one year only, the 1980s was a period in which minimum wages in Latin America reached record lows (Cox-Edwards, 1996), suggesting that the ratio was probably even higher in earlier periods.

Table 3

Real Minimum Wage Changes and other Welfare Measures

All variables are annual log changes, except where noted

(t statistics in parentheses, and all coefficients significant at 5% level are in bold typeface)

	Poverty Gap 1/		Per Capita Calorie Intake			Unemployment 3/	
Log Change in:	*(3.1)	*(3.2)	(3.3)	(3.3a)	(3.4)	*(3.5)	*(3.6)
	High	Low	5/	5/	5/	5/	5/
Per Capita Income	0.45	0.74	0.17	0.10		-0.10	
	(.43)	(.39)	(1.68)	(1.59)		(-1.35)	
Real Minimum Wage	**-0.79**	**-1.59**	0.06	**0.08**	**0.10**	**0.08**	**0.05**
	(-2.73)	(-2.49)	(1.60)	(3.11)	(3.23)	(2.82)	(2.45)
Real Public Spending					0.04		-0.06
					(.61)		(-1.89)
Terms of Trade	-0.46				0.08		-0.03
	(-2.09)				(1.94)		(-1.08)
Human Capital Stock 4/	-1.01	-1.35				-0.09	-0.11
	(-2.07)	(-1.77)				(-1.10)	(-1.38)
Intercept	0.03	0.04	0.00	0.00	0.00	0.01	0.01
	(1.19)	(.80)	(.2)	(.98)	(.37)	(1.36)	(1.47)
White F Test statistic 2/	1.58	1.02	3.37	1.90	1.54	0.45	0.91
Prob Value 2/	0.28	0.47	0.02	0.14	0.21	0.83	0.54
Adjusted R-Squared	0.42	0.56	0.32	0.30	0.37	0.24	0.29
Number of Observation	16	16	30	30	30	21	21

1/ The poverty gap is the headcount ratio times the average income shortfall of the poor.

2/ This is the F test for White's Heteroscedasticity test without cross terms. A high F or low probability values suggests the null hypothesis of homoscedastic errors should be rejected.

3/ The unemployment variable is the change in the unemployment rate divided by the number of years in the interval.

4/ Human capital growth is proxied by the log change in average years of secondary education per adult.

5/ Includes all non-overlapping observations.

* T-statistics are calculated using White Heteroscedasticity consistent covariance matrix.

Table 4. Nominal Minimum Wages vs. Poverty Lines

(for selected countries in 1985)

Acronym	Country	Minimum wage $US	High ratio(1)	Low Ratio(2)
ARG	Argentina	79.29	1.32	2.64
BRA	Brazil	51.95	0.87	1.73
COL	Colombia	95.34	1.59	3.18
CRI	Costa Rica	110.15	1.84	3.67
MEX	Mexico	120.99	2.02	4.03
PER	Peru	36.65	0.61	1.22
PHL	Philippines	93.19	1.55	3.11
PRY	Paraguay	189.06	3.15	6.30
URY	Uruguay	64.25	1.07	2.14

Source: Nominal minimum wage obtained from ILO.

Notes:

(1). Minimum wage to high poverty line ratio ($60 per person per month in constant 1985 dollars.)

(2). Minimum wage to low poverty line ratio ($30 per person per month in constant 1985 dollars.)

measures with the log change in per capita calorie intake. Evidently, the initial estimates suffer from a heteroscedasticity problem. Using per capita growth as a weighting variable the weighted least squares estimates reported as equation 3.3A confirm the results of the first estimate while almost eliminating the heteroscedasticity problem. Again using the same sample of countries and the same time intervals dictated by the poverty data, our final equation evaluates the effect of minimum wages on unemployment. We find real minimum wage changes raise unemployment. According to these estimates, a 10% rise in minimum wages could increase unemployment by .5 to 1%. These estimates, however, must be interpreted with care since regressing our annual pool of unemployment rates on minimum wage changes yield insignificant results. Also among those evaluated here, unemployment is probably the least consistently defined measure of welfare across countries.

III. Concluding Remarks

Our results indicate that minimum wage increases (falls) may be associated with falls (increases) in poverty rates in developing countries. This result was replicated using high and low poverty lines, alternative measures of poverty, and distinguishing observations according to whether the economy was growing or declining, the population was urban or not, and whether the observations were for Latin America or Asia.[28]

These results, however, should not lead to a flat endorsement of minimum wage increases as an effective policy measure to reduce poverty. We found, for example, that higher minimum wages cause unemployment to rise. Also, our analysis does not explore the impact of minimum wage increases on efficiency and competitiveness. If minimum wage legislation has a negative effect on

[28] Using a different approach to analyze this question in the United States, Card and Krueger (1995) find some evidence that "...the effects of the minimum-wage variable on either the overall poverty rate or the poverty rate of workers are negative and marginally significant, suggesting that poverty rates fells faster in states in which the minimum wage had a bigger impact." (P. 305). When the authors control for changes in economic conditions across states, the coefficient although still negative becomes statistically insignificant.

competitiveness, it could hurt the poor indirectly via the impact of a lower level of competitiveness on growth. Moreover, even if rasing the minimum wages can be shown to reduce poverty in the short-run, the long-run impact could be the opposite because higher minimum wages are likely to reduce employment opportunities in better quality jobs.

Nevertheless, while these results do not demonstrate that raising minimum wages is an effective instrument to reduce poverty, eliminating or reducing minimum wages in developing countries may hurt the poor.

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APPENDIX

This appendix describes the data sources and discusses several estimation issues raised by the income and minimum wage elasticities of poverty estimates presented in the main body of the paper. In particular, Table A.1 lists the countries and time intervals classified into growing and contracting economies. Table A.5 lists all of the poverty measures used as dependent variables, along with their published source and any available documentation on the poverty line and type of survey data used to obtain the poverty estimate (i.e. whether the poverty line was defined in terms of income or consumption expenditures, whether the rate refers to households or persons, the region covered by the survey, etc.). Apart from the wage and unemployment data, most of the remaining data for the dependent variables was obtained from the World Bank's World Tables 1994 published on CD-ROM. The sources for the minimum wage data were mainly the ILO (1988) and several unpublished tables of real minimum wages by the ILO and CEPAL researchers. For average wages, the sources are ILO's Year Book, CEPAL (1994) and World Bank's World Tables (manufacturing wages).

The range and average changes of the observations included in our "standard" regression 1.7 are the following. For the real minimum (average) wage, the change goes from -9.6 (-4.3) to 4.7 (10) percent per year; the average for the positive observations is 2.5 (3.3) percent and -3.3 (-1.9) percent per year for the negative ones. For poverty (headcount), the numbers are: the range is from -7.7 to 8.4 percent per year; and, the averages are 3.5 and -4.5 percent per year for positive and negative observations, respectively. A complete listing the of data in spreadsheet format is available from the authors upon request.

A.1 The Magnitude of Poverty Elasticities

The main dependent variable in this study is the headcount measure of poverty. If economic growth raises income uniformly across all persons or household, the rate at which the headcount ratio falls depends both upon shape of the Lorenz curve and upon the initial level of poverty. This point is illustrated by Cline (1993) in his comment on Morley (1992). The fact that the elasticity varies with the level of the poverty line has potentially important implications for the results reported in Table 1 of the paper where it seems that the minimum wage poverty elasticity is higher for the lower poverty line headcount measure. Is this result due to the fact that increases in the minimum wage benefits lower income groups more or is it simple due to the effect noted above? To gain some insight into this question we can briefly explore the sensitivity of the poverty elasticity to the level of poverty, Several researchers including Cline (1972) and Lydall (1968) have found the Pareto function,

$$N = A(y_m)^{-b}$$

provides a useful approximation to observed cumulative income distributions where N is the number of persons or households and y_m is the lowest observed level of income with $b > 1$. Thus for any given poverty line income, y_p, the number of persons with income above the poverty line is $A(y_p)^{-b}$ and the headcount poverty rate is simply,

$$H = 1 - (y_p/y_m)^{-b}$$

Cline then shows the elasticity with respect to a uniform rise in income per capita, y

$$\epsilon = -b / [(y_{p/}y_m)^b - 1].$$

The Gini coefficient for the Pareto distribution function, G = 1/[2b-1], can be used to determine a plausible value for b. Given a Gini coefficient of .45, b is roughly 1.5. The poverty-income elasticity now depends on the relationship between the poverty line y_p and the minimum level of (subsistence) income y_m. Cline argues that a plausible value for the ration $y_{p/}y_m$ is 1.5 yielding a poverty income elasticity of about -1.8, very similar to that reported in regression 1.1 in Table 1 of our paper.

Returning to the question at hand: how sensitive is the poverty elasticity to change in the poverty line, especially to a lower poverty line? Figure A.1 plots the several possible methods of computing the poverty-income elasticity against various poverty lines (more precisely various ratios of poverty line to minimum income $y_{p/}y_{m)}$. As is clear from examine the formula for ϵ, this elasticity rises as the poverty line falls. For comparison we plot the poverty elasticity used here against the same range of changes in the poverty (that is log change in H over the log change income at each poverty line shown in the y axis of Figure A.1). Both elasticities are sensitive to change in the poverty line, although the elasticity used here is less sensitive. One somewhat arbitrary method avoiding this problem is use an elasticity based on the change in log(1+H) as opposed to the log(H). This was the measure used by Morley (1992). When the high and low poverty line estimates reported in Table 1 are estimated using the change in log(1+H) as the dependent variable similar estimated coefficients for all variables except the difference between the high and low poverty line coefficients is reduced. The elasticity of the lower poverty lines with respect to the minimum wage is still higher but the difference is insignificant according to the standard F tests. The conclusion of this discussion is that the lower poverty line elasticity appears to be higher than for the upper poverty line but this may be simply an artifact of the method used to gauge changes in poverty. All of the elasticities pictured in Figure A.1 rise as the poverty line falls relative to the minimum income of the population.

A.2 Poverty Data Sample and Sources

The majority of poverty measures used as the dependent variable in this study came from

recent recompilations of survey data undertaken by World Bank researchers and the ILO. The majority of the data comes from three studies by Chen, Datt and Ravallion (1991), Psacharopoulos et. al. (1993), and Tabatabai and Fouad (1993). We also obtained a number of poverty estimates from the World Development Report (1990) and the World Tables 1994 (CD-rom version) and from some (unpublished) individual country sources. In total, there is information for 22 countries, nine outside Latin America. In every case, we only used two observations based on similar surveys. Of 223 total observations, 89 were based on household data in both years, the remaining used persons in poverty. Fifty five observations used expenditure based poverty lines, while the rest used income to define the poverty line. Of the 223 measures, our sample included 40 poverty gaps and 39 income gap or shortfall ratios. The remaining 144 measures were headcount ratios. Of the 223 total observations, 83 were based on lower poverty lines (less than $40 per month $1985 ppp per person) and the remaining 1140 were based on higher poverty lines (above ppp$40). Fifty three of the measures came from urban areas, 21 from rural areas and the rest were based on national surveys.

The average interval between observations in a set was almost eight years, although the median was seven years. The fact that the majority of the observations were from the 1980s actually is an advantage. In over one third (89) of our observations in the full sample (including overlapping periods) poverty rose over the interval in questions (in 134 cases it fell). Similarly, real minimum wages rose in about two thirds of our observations and fell in 70 cases. This implies that our estimates do not simply represent trends in these two key variables. During normal times one expects poverty rates to fall and minimum wage rates to rise, but this was not the case during the 1980s.

Table A.1 shows the countries and periods classified into growth and recession episodes. Tables A.2 and A.3 show the frequency of countries and periods for the “standard” regression 1.7 (Table 1 in main text). Table A.4 presents a three-way classification of the full sample for minimum wages, per capita income and poverty. Finally, Table A.5 lists all of the poverty measures used in this study along with the source and characteristics mentioned above.

The regressions reported in this paper use a number of different samples of poverty changes. The length and country composition of the observations are generally determined by the availability of survey based poverty measures. A few observations were dropped because of the extraordinary (unlikely) changes in poverty and/or minimum wages. Some observations were dropped because of the large changes in poverty in minimum wages tended to distort the results for the non-minimum wage variables. These include Venezuela between 1987 and 1989, Peru during in the 1980s. Also because many observations overlap, there are alternative ways to organize the data. The specific sample used in each regression and the complete data set used in this study is available from the authors.

Figure A.1

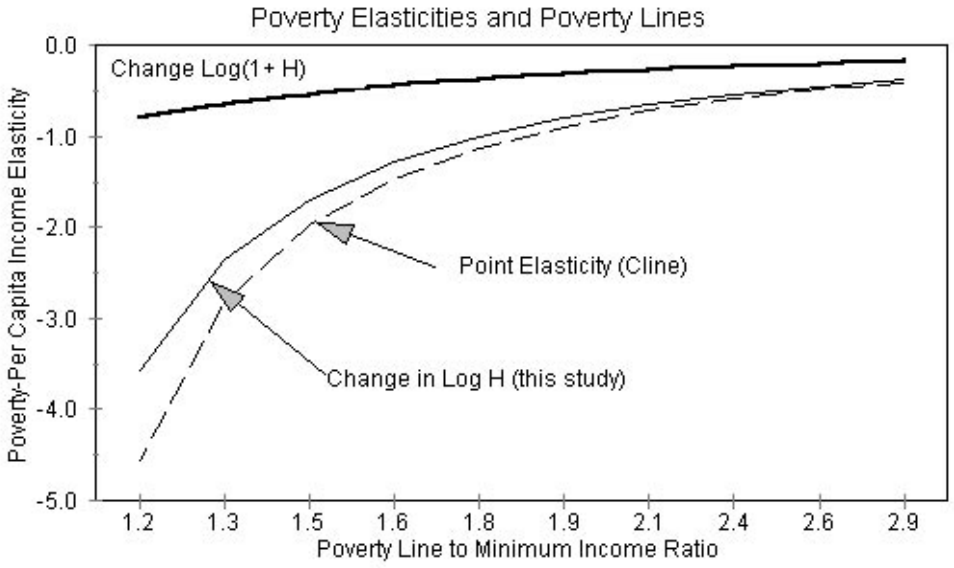
Poverty Elasticities and Poverty Lines
Change Log(1+ H)
Point Elasticity (Cline)
Change in Log H (this study)
Poverty-Per Capita Income Elasticity
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
1.2
1.3
1.5
1.6
1.8
1.9
2.1
2.4
2.6
2.9
Poverty Line to Minimum Income Ratio

Table A.1 Countries and Periods Included in Regressions(1)

Country	Periods			
	Headcount Ratio as Dependent Variable		Poverty Gap as Dependent Variable	
	Recession	Growth	Recession	Growth
Africa				
Ghana		1987-90(h)(n)		
Mauritius		1980-87(h)(n)		
Morocco		1970-84(h)(n), 1975-80(l)(r), 1980-85(l)(r), 1984-90*(n)		1970-84(h)(n)
Tunisia		1975-80*(n), 1975-80(l)(r), 1980-85*(n), 1980-85(l)(r), 1985-90*(n)		
Asia and the Pacific				
India		1977-83(h)(n), 1978-83(l)(r)		1977-83(h)(n)
Indonesia		1984-90(l)(n), 1984-87(l)(r), 1987-90(h)(n), 1990-93(h)(n)		
Philippines		1971-85*(n), 1971-85(l)(r), 1985-88*(n)		
Sri Lanka		1963-82(l)(n), 1973-78(l)(r), 1985-90*(n)		1963-82(l)(n)
Thailand		1975-81(h)(n), 1976-81(l)(r), 1981-88(h)(n)		1981-86(h)(n)
Latin America and the Caribbean				
Argentina	1980-89*(u)		1980-89(h)(u)	
Bolivia		1986-89*(u)		1986-89*(u)
Brazil		1980-89*(n), 1980-89(h)(r)		1980-89*(n)
Colombia		1971-78(h)(n), 1978-88(h)(n), 1980-89(l)(u), 1988-91*(n)		1971-78(h)(n), 1980-89*(u)
Costa Rica	1977-83(h)(n), 1977-83(l)(r), 1981-89*(n)	1971-77(h)(n), 1971-77(l)(r), 1983-86(h)(n), 1983-86(l)(r)	1977-83(h)(n), 1981-89(l)(n)	1983-86(h)(n)
Guatemala		1986-89*(r)		1986-89(h)(n)
Honduras		1986-89*(u)		1986-89*(u)
Mexico	1984-89*(n)			
Panama	1979-89(l)(n), 1979-89(h)(r)		1979-89*(n)	
Paraguay		1983-90*(u)		1980-89*(u)
Peru	1979-86(l)(u)		1986-90*(u)	
Uruguay	1981-89*(u)		1981-89*(u)	
Venezuela	1981-89(l)(r), 1982-89*(n)			

Note:

(1). Minimum wage data is available for each observation included.

*. Headcount ratios or poverty gap ratios for both high and low poverty lines are available for this observation.

(h). Only headcount ratio or poverty gap ratio for high poverty line is available for this observation.

(l). Only headcount ratio or poverty gap ratio for low poverty line is available for this observation.

(n). National headcount ratio or poverty gap ratio.

(u). Urban headcount ratio or poverty gap ratio.

(r). Rural headcount ratio or poverty gap ratio.

Table A2. The Frequency of Countries in the Standard Regression (1.7)

COUNTRY	FREQUENCY
Argentina	1
Bolivia	1
Brazil	1
Colombia	3
Costa Rica	2
Ghana	1
Guatemala	1
Honduras	1
India	1
Indonesia	2
Mauritius	1
Mexico	1
Morocco	2
Panama	1
Paraguay	1
Philippines	2
Sri Lanka	1
Thailand	2
Tunisia	3
Uruguay	1
Venezuela	1
Total	30

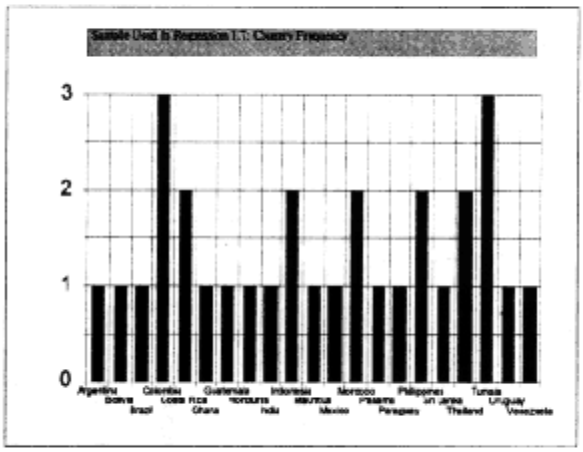

Table A3. The Frequency of Periods in the Standard Regression (1.7)

PERIOD	FREQUENCY
70-80	2
70-85	2
75-80	1
75-85	2
75-90	2
80-85	1
80-90	10
85-90	8
85-93	1
90-93	1
Total	30

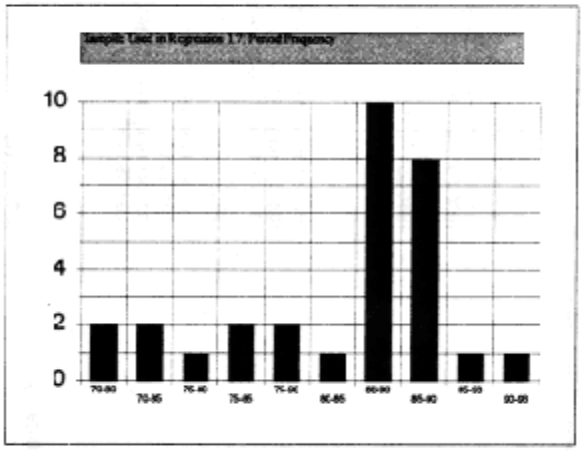

Table A4. Three by three plot of changes in poverty, minimum wage, and GDP per capita*
M:\QPRO\LABOR\PUBAPP\TABLEA4.WB2
(total=180)

	Poverty falls				Poverty increases			
	(total=5)				(total=37)			
Minimum Wage and GDP fall together	URY_81_89 (H)(IS)(U)				ARG_80_89(H)(IS)(U)	**PAN_79_89(H)(R)**	PER_86_90(L)(IS)(U)	VEN_81_89(L)(PG)(N)
	URY_81_89 (H)(U)				**ARG_80_89(H)(PG)(U)**	PAN_79_89(L)(IS)(N)	**PER_86_90(L)(PG)(U)**	**VEN_82_89(H)(N)**
	URY_81_89 (L) (PG) (U)				**ARG_80_89(H)(U)**	**PAN_79_89(L)(N)**	**PER_86_90(L)(U)**	**VEN_82_89(L)(N)**
	URY_81_89(H)(PG)(U)				**ARG_80_89(L)(U)**	**PAN_79_89(L)(PG)(N)**	URY_81_89(L)(IS)(U)	VEN_87_89(H)(N)
	URY_81_89(L)(U)				BRA_80_83(L)(N)	**PER_79_86(L)(U)**	VEN_81_89(H)(IS)(N)	VEN_87_89(H)(N)
					MEX_84_89(H)(N)	PER_80_90(L)(U)	VEN_81_89(H)(PG)(N)	VEN_87_89(L)(N)
					MEX_84_89(L)(N)	PER_80_91(L)(U)	**VEN_81_89(H)(R)**	VEN_87_89(L)(R)
					PAN_79_89(H)(IS)(N)	PER_86_90(H)(IS)(U)	VEN_81_89(L)(IS)(N)	
					PAN_79_89(H)(N)	**PER_86_90(H)(PG)(U)**	VEN_81_89(L)(N)	
					PAN_79_89(H)(PG)(N)	PER_86_90(H)(U)	VEN_81_89(L)(N)	
	(total=18)				(total=24)			
Minimum wage falls but GDP increases	BRA_83_86(H)(N)	GTM_86_89(H)(N)	**PHL_71_85(L)(N)**		BRA_79_89(H)(U)	BRA_80_89(L)(N)	**GHA_87_90(H)(N)**	**HND_86_89(H)(U)**
	BRA_83_87(H)(N)	GTM_86_89(L)(N)	PHL_71_88(L)(N)		**BRA_80_87(H)(N)**	**BRA_80_89(L)(N)**	**GTM_86_89(H)(PG)(N)**	**HND_86_89(L)(PG)(U)****
	COL_88_91(H)(N)	HND_86_89(H)(U)	**TUN_85_90(H)(N)**		BRA_80_89(H)(IS)(N)	**BRA_80_89(L)(PG)(N)**	**GTM_86_89(H)(R)**	**HND_86_89(L)(U)**
	COL_88_91(L)(N)	HND_86_89(L)(U)	TUN_85_90(H)(N)		**BRA_80_89(H)(N)**	BRA_81_87(H)(N)	**GTM_86_89(H)(U)**	**PHL_71_85(H)(N)**
	CRI_71_77(H)(N)	**LKA_85_90(H)(N)**	TUN_85_90(L)(N)		**BRA_80_89(H)(PG)(N)**	BRA_85_89(H)(N)	**GTM_86_89(L)(R)**	**PHL_71_85(L)(R)****
	CRI_71_77(L)(R)	**LKA_85_90(L)(N)**	**TUN_85_90(L)(N)**		**BRA_80_89(H)(R)**	BRA_85_89(L)(N)	**HND_86_89(H)(U)**	PHL_71_88(H)(N)
	(total=64)				(total=16)			
Both minimum wage and GDP increase	**BRA_70_80(L)(N)**	**CRI_83_86(H)(PG)(N)**	**LKA_63_82(L)(N)**	**PRY_80_89(H)(PG)(U)**	BOL_86_89(H)(IS)(U)			
	COL_71_78(H)(IS)(N)	**CRI_83_86(L)(R)**	**LKA_63_82(L)(PG)(N)**	**PRY_80_89(L)(PG)(U)**	**BOL_86_89(H)(PG)(U)**			
	COL_71_78(H)(N)	**IDN_84_87(L)(N)**	**LKA_73_78(L)(R)**	PRY_83_90(H)(IS)(U)	**BOL_86_89(H)(U)**			
	COL_71_78(H)(PG)(N)	**IDN_84_87(L)(R)**	MAR_70_84(H)(IS)(N)	**PRY_83_90(H)(U)**	BOL_86_89(L)(IS)(U)			
	COL_71_88(H)(IS)(N)	IDN_84_90(H)(N)	**MAR_70_84(H)(N)**	**PRY_83_90(L)(U)**	**BOL_86_89(L)(PG)(U)**			
	COL_71_88(H)(N)	**IDN_84_90(L)(N)**	**MAR_70_84(H)(N)**	**THA_75_81(H)(N)**	**BOL_86_89(L)(U)**			
	COL_78_88(H)(R)	**IDN_87_90(H)(N)**	**MAR_80_85(L)(R)**	**THA_76_81(L)(R)**	COL_78_88(H)(IS)(N)			
	COL_80_89(H)(IS)(U)	**IDN_90_93(H)(N)**	**MAR_84_90(H)(N)**	**THA_81_88(H)(N)**	**COL_78_88(H)(N)**			
	COL_80_89(H)(PG)(U)	IND_72_83(H)(IS)(N)	MAR_84_90(L)(N)	**TUN_75_80(H)(N)**	COL_78_88(H)(PG)(N)			
	COL_80_89(H)(U)	**IND_72_83(H)(N)**	**MAR_84_90(L)(N)**	**TUN_75_80(L)(N)**	CRI_71_86(H)(IS)(N)			
	COL_80_89(L)(IS)(U)	IND_72_83(H)(PG)(N)	MAR_85_91(H)(N)	**TUN_75_80(L)(R)**	CRI_83_86(H)(IS)(N)			
	COL_80_89(L)(PG)(U)	IND_77_83(H)(IS)(N)	MAR_85_91(L)(N)	TUN_75_80(L)(U)	**MAR_75_80(L)(R)****			
	COL_80_89(L)(U)	**IND_77_83(H)(N)**	**MUS_80_87(H)(N)**	**TUN_80_85(H)(N)**	PRY_83_90(L)(IS)(U)			
	CRI_71_86(H)(N)	**IND_77_83(H)(PG)(N)**	MUS_84_90(H)(N)	**TUN_80_85(L)(N)**	THA_81_86(H)(IS)(N)			
	CRI_71_86(H)(PG)(N)	**IND_78_83(L)(R)**	**PHL_85_88(H)(N)**	**TUN_80_85(L)(R)**	THA_81_86(H)(N)			
	CRI_83_86(H)(N)	LKA_63_82(L)(IS)(N)	**PHL_85_88(L)(N)**	TUN_80_85(L)(U)	**THA_81_86(H)(PG)(N)**			
	(total=9)				(total=7)			
Minimum wage increases but GDP falls	CRI_77_83(H)(IS)(N)				**CRI_77_83(H)(N)**			
	CRI_81_89(H)(IS)(N)				**CRI_77_83(H)(PG)(N)**			
	CRI_81_89(H)(N)				**CRI_77_83(L)(R)**			
	CRI_81_89(H)(PG)(N)				VEN_82_87(H)(IS)(N)			
	CRI_81_89(H)(R)				VEN_82_87(H)(N)			
	CRI_81_89(H)(U)				VEN_82_87(H)(PG)(N)			
	CRI_81_89(L)(IS)(N)				VEN_82_87(L)(R)			
	CRI_81_89(L)(N)							
	CRI_81_89(L)(PG)(N)							

Table A5. Poverty data

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Country/period(a)	PovInd(b)	yrs(c)	First(d)	Last(e)	U/N/R(f)	Poverty Line US$ppp/mont	L/H(g)	Source(k)	H/P(h)	I/E(i)
ARG_80_89	h	9	3.0	6.4	U	60	H	(1)	H	I
ARG_80_89	pg	9	0.6	2.1	U	60	H	(2)	H	I
ARG_80_89	is	9	20.0	32.8	U	60	H	#		
ARG_80_89	h	9	0.2	1.6	U	30	L	(1)	H	I
BGD_82_89	h	7	78.8	49.0	N	NA	H	(4)	n.a.	n.a.
BGD_82_89	h	7	54.1	28.8	N	NA	L	(4)	n.a.	n.a.
BGD_85_88	h	3	17.0	28.5	N	30.42	L	(5)	P	E
BGD_85_88	h	3	74.6	81.6	N	60	H	(5)	P	E
BOL_86_89	pg	3	22.8	24.4	U	60	H	(2)	H	I
BOL_86_89	h	3	22.5	23.2	U	30	L	(1)	H	I
BOL_86_89	h	3	51.1	54.0	U	60	H	(1)	H	I
BOL_86_89	is	3	33.8	40.1	U	30	L	#		
BOL_86_89	is	3	44.6	45.2	U	60	H	#		
BOL_86_89	pg	3	7.6	9.3	U	30	L	(2)	H	I
BRA_60_80	pg	20	23.0	8.6	N	25-60*	H	#		
BRA_60_80	is	20	46.0	41.0	N	25-60*	H	(3)	H	I
BRA_60_80	h	20	50.0	21.0	N	25-60*	H	(3)	H	I
BRA_70_80	h	10	47.9	26.2	N	NA	L	(4)	n.a.	n.a.
BRA_79_89	pg	10	13.7	18.8	N	60	H	(2)	H	I
BRA_79_89	is	10	40.2	46.0	N	60	H	#		
BRA_79_89	pg	10	3.9	7.1	N	30	L	(2)	H	I
BRA_79_89	h	10	34.1	40.9	N	60	H	(1)	H	I
BRA_79_89	is	10	32.0	38.0	N	30	L	#		
BRA_79_89	h	10	23.9	33.2	U	60	H	(6)	H	I
BRA_79_89	h	10	12.2	18.7	N	30	L	(1)	H	I
BRA_80_83	h	3	17.0	30.0	N	NA	H	(8)	n.a.	n.a.
BRA_80_87	h	7	17.0	24.0	N	NA	H	(8)	n.a.	n.a.
BRA_80_89	h	9	23.9	33.2	U	60	H	(11)	H	I
BRA_80_89	h	9	55.0	63.1	R	60	H	(11)	H	I
BRA_81_87	h	6	19.0	24.0	N	25-60*	H	(7)	P	I
BRA_83_86	h	3	30.0	15.0	N	NA	H	(8)	n.a.	n.a.
BRA_83_87	h	4	30.0	24.0	N	NA	H	(8)	n.a.	n.a.
BRA_85_89	h	4	49.6	53.1	N	60	H	(5)	P	I
BRA_85_89	h	4	26.7	31.1	N	30.42	L	(5)	P	I
COL_71_78	h	10	41.0	24.0	N	25-60*	H	(3), (7)	P	I
COL_71_78	is	10	41.0	36.0	N	25-60*	H	(3), (7)	P	I
COL_71_78	pg	10	16.8	8.6	N	25-60*	H	#		
COL_71_88	is	17	41.0	38.0	N	25-60*	H	(3)	P	I
COL_71_88	h	17	41.0	25.0	N	25-60*	H	(3)	P	I
COL_78_88	pg	10	8.6	9.5	N	25-60*	H	#		
COL_78_88	h	10	85.0	68.0	R	NA	L	(10)	P	E
COL_78_88	h	10	24.0	25.0	N	25-60*	H	(7)	P	I
COL_78_88	is	10	36.0	38.0	N	25-60*	H	(7)	P	I
COL_80_89	is	9	47.7	41.3	U	60	H	#		
COL_80_89	is	9	51.7	44.8	U	30	L	#		
COL_80_89	pg	9	3.1	1.3	U	30	L	(2)	H	I
COL_80_89	pg	9	6.2	3.3	U	60	H	(2)	H	I
COL_80_89	h	9	13.0	8.0	U	60	H	(1)	H	I
COL_80_89	h	9	6.0	2.9	U	30	L	(1)	H	I
COL_88_91	h	3	23.7	19.7	N	60	H	(5)	P	I
COL_88_91	h	3	9.1	6.6	N	30.42	L	(5)	P	I

Table A5. Poverty data

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Country/period(a)	PovInd(b)	yrs(c)	First(d)	Last(e)	U/N/R(f)	Poverty Line US$ppp/montl	L/H(g)	Source(k)	H/P(h)	I/E(i)
CRI_71_77	h	6	45.0	29.0	N	80	H	(3), (7)	P	I
CRI_71_77	h	6	37.0	21.0	R	NA	L	(10)	P	E
CRI_71_86	pg	15	18.0	10.6	N	80	H	#		
CRI_71_86	is	15	40.0	44.0	N	80	H	(3)	P	I
CRI_71_86	h	15	45.0	24.0	N	80	H	(3)	P	I
CRI_77_83	h	6	21.0	42.0	R	NA	L	(10)	P	E
CRI_77_83	h	6	29.0	36.0	N	80	H	(7)	P	I
CRI_77_83	is	6	44.0	39.0	N	80	H	(7)	P	I
CRI_77_83	pg	6	12.8	14.0	N	80	H	#		
CRI_81_89	pg	8	2.2	0.4	N	30	L	(2)	H	I
CRI_81_89	h	8	16.7	3.2	R	60	H	(9)	H	I
CRI_81_89	pg	8	5.9	1.3	N	60	H	(2)	H	I
CRI_81_89	h	8	13.4	3.4	N	60	H	(1)	H	I
CRI_81_89	h	8	9.9	3.5	U	60	H	(1)	H	I
CRI_81_89	h	8	61.6	43.0	N	60	H	(5)	P	I
CRI_81_89	h	8	5.4	1.1	N	30	L	(1)	H	I
CRI_81_89	h	8	33.9	18.8	N	30.42	L	(5)	P	I
CRI_81_89	is	8	44.0	38.0	N	60	H	#		
CRI_81_89	is	8	40.7	36.4	N	30	L	#		
CRI_83_86	is	3	39.0	44.0	N	80	H	(7)	P	I
CRI_83_86	h	3	36.0	24.0	N	80	H	(7)	P	I
CRI_83_86	h	3	42.0	25.0	R	NA	L	(10)	P	E
CRI_83_86	pg	3	14.0	10.6	N	80	H	#		
GTM_86_89	pg	3	34.6	37.1	N	60	H	(2)	H	I
GTM_86_89	h	3	36.6	39.5	N	30	L	(1)	H	I
GTM_86_89	h	3	71.8	76.5	R	60	H	(6)	H	I
GTM_86_89	h	3	48.7	50.9	U	60	H	(6)	H	I
GTM_86_89	h	3	60.0	51.6	N	30.42	L	(5)	P	I
GTM_86_89	h	3	82.9	74.9	N	60	H	(5)	P	I
HND_86_89	h	3	48.7	54.4	U	60	H	(1)	H	I
HND_86_89	pg	3	22.3	24.2	U	60	H	(2)	H	I
HND_86_89	h	3	21.6	22.7	U	30	L	(1)	H	I
HND_86_89	pg	3	8.3	8.3	U	30	L	(2)	H	I
HND_86_89	is	3	38.4	36.6	U	30	L	#		
HND_86_89	is	3	45.8	44.5	U	60	H	#		
IDN_70_87	h	17	58.0	17.0	N	25-60*	H	(3)	P	E
IDN_70_87	pg	17	21.5	2.9	N	25-60*	H	#		
IDN_70_87	is	17	37.0	17.0	N	25-60*	H	(3)	P	E
IDN_80_87	h	7	44.6	21.6	N	NA	H	(4)	n.a.	n.a.
IDN_80_87	h	7	28.6	17.4	N	NA	L	(4)	n.a.	n.a.
IDN_80_90	h	10	28.6	15.1	N	NA	L	(4)	n.a.	n.a.
IDN_84_87	h	3	14.0	8.3	U	NA	L	(10)	P	E
IDN_84_87	h	3	32.6	18.5	R	NA	L	(10)	P	E
IDN_84_90	h	6	38.7	21.7	N	30.42	L	(5)	P	E
IDN_84_90	h	6	80.9	71.4	N	60	H	(5)	P	E
IDN_87_90	h	3	21.6	16.7	N	NA	H	(4)	n.a.	n.a.
IND_70_89	h	19	42.5	25.4	N	NA	H	(4)	n.a.	n.a.
IND_72_83	is	11	31.0	28.0	N	25-60*	H	(3)	P	E
IND_72_83	h	11	54.0	43.0	N	25-60*	H	(3)	P	E
IND_72_83	pg	11	16.7	12.0	N	25-60*	H	#		
IND_77_83	h	5	50.0	43.0	N	25-60*	H	(7)	P	E

Table A5. Poverty data

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Country/period(a)	PovInd(b)	yrs(c)	First(d)	Last(e)	U/N/R(f)	Poverty Line US$ppp/montl	L/H(g)	Source(k)	H/P(h)	I/E(i)
IND_77_83	is	6	29.0	28.0	N	25-60*	H	(7)	P	E
IND_77_83	pg	5	14.5	12.0	N	25-60*	H	#		
IND_78_83	h	5	52.0	43.0	R	NA	L	(10)	P	E
IND_83_89	h	6	95.1	94.8	N	60	H	(5)	P	E
IND_83_89	h	6	73.5	70.9	N	30.42	L	(5)	P	E
KOR_70_80	h	10	4.8	13.3	N	NA	H	(4)	n.a.	n.a.
KOR_80_84	h	4	9.8	4.5	N	NA	L	(4)	n.a.	n.a.
LKA_63_82	pg	19	13.0	7.8	N	25-60*	H	#		
LKA_63_82	h	19	37.0	27.0	N	25-60*	H	(3)	P	I
LKA_63_82	is	19	35.0	29.0	N	25-60*	H	(3)	P	I
LKA_73_78	h	5	31.6	23.8	R	NA	L	(10)	P	E
LKA_85_90	h	5	30.5	20.5	N	30.42	L	(5)	P	E
LKA_85_90	h	5	77.5	72.5	N	60	H	(5)	P	E
MAR_70_84	pg	14	19.8	12.2	N	25-60*	H	#		
MAR_70_84	h	14	43.0	34.0	N	25-60*	H	(3)	P	E
MAR_70_84	is	14	46.0	36.0	N	25-60*	H	(3)	P	E
MAR_75_80	h	5	45.0	45.0	R	NA	L	(10)	P	I
MAR_80_85	h	5	45.0	32.0	R	NA	L	(10)	P	I
MAR_84_90	h	6	7.1	1.8	N	30.42	L	(5)	P	E
MAR_84_90	h	6	38.3	22.9	N	60	H	(5)	P	E
MAR_84_90	h	6	15.9	7.0	N	40	L	(5)	P	E
MAR_85_91	h	6	16.5	7.0	N	NA	L	(4)	n.a.	n.a.
MAR_85_91	h	6	26.0	13.1	N	NA	H	(4)	n.a.	n.a.
MEX_84_89	h	5	2.5	7.3	N	30	L	(1)	H	I
MEX_84_89	h	5	16.6	22.6	N	60	H	(1)	H	I
MUS_80_87	h	7	20.3	10.7	N	NA	H	(4)	n.a.	n.a.
MUS_84_90	ph	6	38.3	22.9	N	NA	H	(4)	n.a.	n.a.
MUS_87_92	h	5	10.7	5.2	N	NA	H	(4)	n.a.	n.a.
MYS_73_84	h	11	37.6	19.6	N	NA	H	(4)	n.a.	n.a.
MYS_73_87	is	14	40.0	24.0	N	118.33	H	(3)	P	I
MYS_73_87	h	14	37.0	15.0	N	118.33	H	(3)	P	I
MYS_73_87	pg	14	14.8	3.6	N	118.33	H	#		
MYS_73_89	h	16	13.7	1.7	N	NA	L	(4)	n.a.	n.a.
MYS_84_89	h	5	19.6	15.5	N	NA	H	(4)	n.a.	n.a.
MYS_84_89	h	5	34.7	27.5	N	60	H	(5)	P	I
MYS_84_89	h	5	12.4	6.4	N	30.42	L	(5)	P	I
PAK_62_84	pg	22	21.1	6.0	N	25-60*	H	#		
PAK_62_84	h	22	54.0	23.0	N	25-60*	H	(3)	H	I
PAK_62_84	is	22	39.0	26.0	N	25-60*	H	(3)	H	I
PAK_79_84	pg	5	4.0	3.8	N	25-60*	H	#		
PAK_79_84	is	5	19.0	19.0	N	25-60*	H	(7)	P	E
PAK_79_84	h	5	21.0	20.0	N	25-60*	H	(7)	P	E
PAN_79_89	h	10	33.0	36.8	R	60	H	(6)	H	I
PAN_79_89	pg	10	2.8	6.1	N	30	L	(2)	H	I
PAN_79_89	pg	10	10.5	14.3	N	60	H	(2)	H	I
PAN_79_89	is	10	33.3	46.2	N	30	L	#		
PAN_79_89	is	10	37.6	45.0	N	60	H	#		
PAN_79_89	h	10	26.0	25.9	U	60	H	(6)	H	I
PAN_79_89	h	10	27.9	31.8	N	60	H	(1)	H	I
PAN_79_89	h	10	8.4	13.2	N	30	L	(1)	H	I
PER_79_86	h	7	38.4	52.3	U	NA	L	(10)	P	E

Table A5. Poverty data

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Country/period(a)	PovInd(b)	yrs(c)	First(d)	Last(e)	U/N/R(f)	Poverty Line US$ppp/montl	L/H(g)	Source(k)	H/P(h)	I/E(i)
PER_80_90	h	10	12.0	17.3	N	NA	L	(4)	n.a.	n.a.
PER_80_91	h	11	12.0	22.0	N	NA	L	(4)	n.a.	n.a.
PER_86_90	is	4	21.2	25.7	U	30	L	#		
PER_86_90	h	4	31.1	40.5	U	60	H	(1)	H	E
PER_86_90	h	4	3.3	10.1	U	30	L	(1)	H	E
PER_86_90	pg	4	0.7	2.6	U	30	L	(2)	H	E
PER_86_90	pg	4	8.6	13.3	U	60	H	(2)	H	I
PER_86_90	is	4	27.7	32.8	U	60	H	#		
PHL_71_85	h	14	63.0	63.0	R	NA	L	(10)	P	E
PHL_71_85	h	14	35.4	28.1	N	NA	L	(4)	n.a.	n.a.
PHL_71_85	h	14	57.0	64.5	N	NA	H	(4)	n.a.	n.a.
PHL_71_88	h	17	57.0	61.8	N	NA	H	(4)	n.a.	n.a.
PHL_71_88	h	17	35.4	24.1	N	NA	L	(4)	n.a.	n.a.
PHL_85_88	h	3	72.4	67.1	N	60	H	(5)	P	E
PHL_85_88	h	3	34.8	29.7	N	30.42	L	(5)	P	E
PRY_83_90	h	7	13.1	7.6	U	60	H	(1)	H	I
PRY_83_90	h	7	3.2	0.6	U	30	L	(1)	H	I
PRY_83_90	pg	7	0.9	0.2	U	30	L	(2)	H	I
PRY_83_90	pg	7	3.8	1.8	U	60	H	(2)	H	I
PRY_83_90	is	7	28.1	33.3	U	30	L	#		
PRY_83_90	is	7	29.0	23.7	U	60	H	#		
SGP_72_82	pg	10	11.5	3.3	U	71.7	H	#		
SGP_72_82	is	10	37.0	33.0	U	71.7	H	(3)	P	E
SGP_72_82	h	10	31.0	10.0	U	71.7	H	(3)	P	E
THA_62_69	h	7	57.0	39.0	N	NA	H	(4)	n.a.	n.a.
THA_62_86	h	24	59.0	26.0	N	25-60*	H	(3)	H	I
THA_69_75	h	6	39.0	30.4	N	NA	H	(4)	n.a.	n.a.
THA_75_81	h	6	30.4	23.0	N	NA	H	(4)	n.a.	n.a.
THA_76_81	h	5	32.9	25.8	R	NA	L	(10)	P	E
THA_81_86	pg	5	5.4	9.1	N	25-60*	H	#		
THA_81_86	h	5	20.0	26.0	N	25-60*	H	(7)	H	I
THA_81_86	is	5	27.0	35.0	N	25-60*	H	(7)	H	I
THA_81_88	hu	7	23.0	21.8	N	NA	H	(4)	n.a.	n.a.
TUN_66_75	h	9	34.0	34.0	U	NA	L	(10)	P	E
TUN_66_75	h	9	49.0	43.0	R	NA	L	(10)	P	E
TUN_75_80	h	5	18.0	11.1	N	NA	L	(4)	n.a.	n.a.
TUN_75_80	h	5	43.0	42.0	R	NA	L	(10)	P	E
TUN_75_80	h	5	34.0	22.0	U	NA	L	(10)	P	E
TUN_75_80	h	5	26.5	11.8	N	NA	H	(4)	n.a.	n.a.
TUN_80_85	h	5	42.0	31.0	R	NA	L	(10)	P	E
TUN_80_85	h	5	22.0	16.0	U	NA	L	(10)	P	E
TUN_80_85	h	5	11.1	7.0	N	NA	L	(4)	n.a.	n.a.
TUN_80_85	h	5	11.8	8.4	N	NA	H	(4)	n.a.	n.a.
TUN_85_90	h	5	8.4	7.3	N	NA	H	(4)	n.a.	n.a.
TUN_85_90	h	5	4.6	2.9	N	30.42	L	(5)	P	E
TUN_85_90	h	5	7.0	5.7	N	NA	L	(4)	n.a.	n.a.
TUN_85_90	h	5	25.9	18.8	N	60	H	(5)	P	E
URY_81_89	pg	8	0.3	0.2	U	30	L	(2)	H	I
URY_81_89	is	8	30.6	26.4	U	60	H	#		
URY_81_89	h	8	6.2	5.3	U	60	H	(1)	H	I
URY_81_89	h	8	1.1	0.7	U	30	L	(1)	H	I

Table A5. Poverty data

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Country/period(a)	PovInd(b)	yrs(c)	First(d)	Last(e)	U/N/R(f)	Poverty Line US$ppp/montl	L/H(g)	Source(k)	H/P(h)	I/E(i)
URY_81_89	is	8	27.3	28.6	U	30	L	#		
URY_81_89	pg	8	1.9	1.4	U	60	H	(2)	H	I
VEN_81_89	h	8	0.7	3.1	N	30	L	(1)	H	I
VEN_81_89	h	8	4.0	12.9	N	60	H	(1)	H	I
VEN_81_89	is	8	27.5	32.6	N	60	H	#		
VEN_81_89	h	8	9.0	23.5	R	60	H	(6)	H	I
VEN_81_89	pg	8	0.2	1.1	N	30	L	(2)	H	I
VEN_81_89	pg	8	1.1	4.2	N	60	H	(2)	H	I
VEN_81_89	is	8	28.6	35.5	N	30	L	#		
VEN_82_87	is	5	26.0	31.0	N	25-60*	H	(7)	P	I
VEN_82_87	h	5	12.0	16.0	N	25-60*	H	(7)	P	I
VEN_82_87	pg	5	3.1	5.0	N	25-60*	H	#		
VEN_82_87	h	5	58.0	71.0	R	NA	L	(10)	H	E
VEN_82_89	h	7	11.0	22.0	N	NA	L	(4)	n.a.	n.a.
VEN_82_89	h	7	24.0	31.0	N	NA	H	(4)	n.a.	n.a.
VEN_87_89	h	2	6.6	20.5	N	30.42	L	(5)	P	I
VEN_87_89	h	2	12.3	30.7	N	40	H	(5)	P	I
VEN_87_89	h	2	71.0	74.0	R	NA	L	(10)	H	E
VEN_87_89	h	2	24.9	49.7	N	60	H	(5)	P	I

Notes:

#. Data calculated from other rows according to the formula that poverty gap equals headcount ratio times income gap.

*. The specific poverty line is not available; this gives us the range that the poverty line lies, between 25 and 60 US$PPP/month.
For purposes of our excercise, they were defined as high poverty line observations.

(a). The first three letters, e.g., ARG, is the acronym of the country name (acronyms are listed in Table A.4).
The numerical part, e.g., 80_89, is the period over which the poverty ratios were colleted.

(b). Indicates the type of poverty ratio: h-headcount ratio, is-income gap,pg-poverty gap.

(c). Number of years in the period.

(d). Poverty ratio at the beginning of the period.

(e). Poverty ratio at the end of the period.

(f). Indicates whether the poverty ratio is urban, rural,or national poverty ratio: U-urban, R-rural, N-national.

(g). Indicates high or low poverty line used in calculation of the poverty ratios: H-high, L-low.

(h). Indicates whether the poverty ratio is household or individual: H-household, P-individual.

(i). Indicates whether the poverty ratio is calculated according to income or expenditure: I-income, E-expenditure.

(k). Different studies use different estimation methods to calculate poverty measures (e.g, methods to correct underreporting).
Even though they may be based on same actual survey data, their estimates could be very different.

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Glossary

ARG	Argentina
BGD	Bangladesh
BOL	Bolivia
BRA	Brazil
CHN	China
COL	Colombia
CRI	Costa Rica
GHA	Ghana
GTM	Guatemala
HND	Honduras
IDN	Indonesia
IND	India
KOR	Korea, Republic of
LKA	Sri Lanka
MAR	Morocco
MEX	Mexico
MUS	Mauritius
MYS	Malaysia
PAK	Pakistan
PAN	Panama
PER	Peru
PHL	Philippines
POL	Poland
PR	Puerto Rico
PRY	Paraguay
RWA	Rwanda
SGP	Singapore
TAI	Taiwan
THA	Thailand
TUN	Tunisia
TZA	Tanzania
URY	Uruguay
VEN	Venezuela
YUG	Yugoslavia, Federal Republic of
E	Welfare measure is expenditure
H	High poverty line
I	Welfare measure is income
L	Low poverty liine
N	National
P	Unit are individuals
R	Rural
U	Urban
h	Headcount ratio
is	Income gap ratio
pg	Poverty gap ratio